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The Progress of

MODERN SURGERY

in Twenty-five Years.

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THE PROGRESS OF MODERN SURGERY IN TWENTY-FIVE YEARS.

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MR. PRESIDENT and Fellows of the Academy of Surgery: A little more than twenty-five years ago I began the study of medicine in the University of Pennsylvania. To-night, by the kind partiality of our distinguished President, I have been selected from many much more worthy of the honor to deliver the annual oration before you. In casting about me for a subject worthy of your consideration, it has occurred to me that I could not do better than present you a bird's-eye view of the more noteworthy advances which have been made in surgery during that time. To investigate them fully and at length would occupy almost as much time as they have required for their development. The first surgical clinic which I ever attended was in the present amphitheatre of the Philadelphia Hospital. The lecturer was the present foremost living American surgeon, our worthy president, Professor D. Hayes Agnew. In those days, at least in this city, the specialists were few in number, and in addition to the work to which they gave special attention they practised as general surgeons or even as general practitioners. The staff of Wills Eye Hospital, for instance, consisted of four gentlemen, not one of whom devoted his exclusive attention to diseases of the eye. To-day the staff consists of ten ophthalmic surgeons,

who, with one exception, are eye specialists, or, at least, wander no farther from the eye than to the ear or throat. At that time any general surgeon would operate for cataract or strabismus or any of the ordinary operations on the eye or its appendages. To-day the general surgeon as a rule contents himself with treating conjunctivitis or iritis, or, perhaps, the removal of foreign bodies from the eye or lids, and if anything more serious presents itself he refers it to his favored specialist. Twenty-five years ago how many specialists were there in gynæcology, otology, laryngology, dermatology, genito-urinary and venereal diseases? As I recollect it, the gynæcological clinic, so far as treatment was concerned, was about equally divided between the insertion of pessaries, the application of nitrate of silver, iodine, potassa cum calce or fuming nitric acid to the os or cervix, and the administration of astringent vaginal injections. To-day, every well organized hospital has, in addition to its medical, surgical and, perhaps, obstetrical staff, one or more of all the above specialists. In those days gynæcology was practically in the hands of the obstetricians. To day, so numerous have become the operations of the gynæcologists that they constitute a distinct class by themselves, and, while eschewing general surgery, they have also divorced themselves from obstetrics. While specialism has thus advanced, the natural inference would be that the domain of the general surgeon was gradually but surely being contracted, but on the contrary, it has been enormously enlarged. The cavities of the cranium, of the thorax, of the abdomen, independent of the above specialties, have been explored and conquered to such an extent that it really seems as if we must now at least have reached the limit, but that is exactly what seemed to have been demonstrated twenty-five years ago. Twenty-five years

from now the orator who addresses you will look back as I do now, and wonder how crude and barbarous our methods were as compared with modern science. And yet the record of twenty-five years is a noble one, and one of which we have no cause to be ashamed. Let me begin now to chronicle some of the advances and failures which have occurred during the twenty-five years last past.

In 1865, Mr. Joliffe Tufnell stated that out of ninety of the principal surgical hospitals of Great Britain and Ireland, in seven only was it the custom to immediately put up fractures by starch or other fixed material. With all the improvements which have been made in the application of plaster of Paris to this purpose; after all that has been written on the subject; in spite of the many demonstrations which have been made of its utility, safety and comfort, it seems remarkable that this method has not made more converts, and probably to day the proportion of hospitals in which it is used has not increased since then. The discovery of the local anæsthetic effects of sulphuric ether, when used as a spray, by Dr. B. W. Richardson in 1866, was loudly heralded as a great advance in surgery. It seems now to have gone out of fashion, being but seldom used, although undoubtedly applicable to a wide range of minor surgical affections.

The treatment of cancerous tumors by the injection of acetic acid had but a short-lived notoriety, and is now no longer resorted to.

The immediate treatment of stricture of the urethra by rupture of the stricture by means of Holt's, Thompson's, and other dilators, caused a great sensation, and was extensively practised by many surgeons. The most extravagant claims were made for it. Mr. Holt himself considering that it must ultimately supersede all other modes of treatment. It was

claimed that the stricture rarely returned even when after-treatment had been neglected, and after the lapse of years that the same instrument could be passed which was admissible at the time of the operation. Mr. Holt reported that he had operated in a single year on one hundred and fourteen cases without a single bad result of any kind whatever, and with only one complication, a small abscess of the penis, which arose in consequence of the density of the stricture breaking the directing rod of the instrument. "The cases embraced every variety, and occurred in private and hospital practice in patients sent to him from all parts of the kingdom and abroad." Here, then, was apparently the ideal operation for stricture—safe—speedy—radical. It certainly was very satisfactory, both to patient and surgeon, to have a stricture in a few seconds enlarged from the finest calibre to one that would carry a large-sized bougie, and to enable a patient who had been urinating only by drops to pass a full-sized stream, but the results obtained by other surgeons were not so successful. Experience demonstrated that strictures treated by this method would relapse as rapidly and as often as those treated by other methods. Accidents, such as hemorrhage, abscess, etc., resulted. Urethral fever and pyæmia were not uncommon. The method is still used, but by comparatively few surgeons, and its sphere of usefulness is certainly much more limited than its disciples maintained.

In *The British Medical Journal* of February 5, 1867, will be found an article by Joseph Lister, Esq., then Professor of Surgery in the University of Glasgow, on a new method of treating compound fractures, abscesses, etc. I cannot forbear giving a synopsis of it. "The reason that a compound fracture usually proves so much more dangerous to life, and serious in its results to the limb, is not the simple access of

oxygen, but of the septic particles which alway exist in the atmosphere. These act like yeast, producing decomposition in everything susceptible of it." "The truth of this has been proved by the philosophic researches of Mr. Pasteur. In a compound fracture twenty-four hours after the accident, the colored serum which oozes from the wound is already distinctly tainted with decomposition. This state of things is enough to account for all the bad consequences of the injury. By the application of carbolic acid to the wound this decomposition of the blood and other effused fluids may be prevented. Carbolic acid forms with the blood a solid crust which prevents the access of these septic particles contained in the atmosphere, and retains for a long time its antiseptic properties. Having put up the limb comfortably, lay on the wound a piece of lint soaked in carbolic acid, and allow it to remain undisturbed. If looked at, at the end of several days, no signs of suppuration will be found. If any blush of redness occurs round the sore the lint may be removed, and the wound dressed with water having a small proportion of carbolic acid diffused in it. As carbolic acid is almost absolutely insoluble in water, but dissolves readily in the fixed oils or glycerine, these may, in some cases, prove very suitable applications. In some cases it is well not to remove the lint at all, but to cover it with a piece of very fine and thin block tin to prevent the evaporation of the volatile organic acid. A firm crust is formed by the blood, lint and carbolic acid beneath which no suppuration occurs."

How little then could even the writer of the paper have foreseen the mighty revolution in surgery and surgical methods of which this paper was the forerunner. Who would have believed that from the immortal principle proclaimed by Lister such wonderful results would have been attained. It is entirely

unnecessary for me to trace the subsequent history of Listerism. You are all familiar with it. In the words of Mr. W. Watson Cheyne, "Listerism or asepticism is a great principle which has triumphantly withstood the most searching tests, and which is now a law of the first importance to the practical surgeon." The Listerian or aseptic method is the best means at present known of carrying out that law in surgical practice, but the means have always been improving and must continue to improve. The time may indeed come when the method shall have undergone an entire alteration, but nevertheless the principle underlying it will always remain the same. Whatever changes may occur in the present Listerian method, Listerism will always remain the most fundamental principle of wound treatment, and the surgeon when he makes a wound will Lister it in the fullest sense of that term. The same thing has occurred with all-natural laws. When once discovered and firmly established they remain immutable, but the practical applications of these are constantly widening and improving.

Acupressure, first presented to the world by its inventor, Sir. Jas. Y. Simpson, in December, 1859, in a communication to the Royal Medico-Chirurgical Society, of Edinburgh, in my earlier days was supposed by some of its advocates to be certain to entirely supplant the ligature as a means of arresting hemorrhage. Its inventor's own estimate of it shortly before his death was that, "Acupressure will one day do more for my fame than even the discovery of chloroform." In 1867 it was stated in articles by Sir James Y. Simpson and Dr. Pirrié that "upwards of eight hundred vessels have now been stopped by acupressure by the surgeons to the Aberdeen Infirmary. These have been in all kinds of serious operations, and yet in only two of them has

there been any hemorrhage on removal of the needle; one of these was after removal of the leg in its upper third for medullary cancer; the second was the radial artery, hemorrhage from which was arrested at once by replacing the needle. This is quite conclusive as to accupressure being a perfectly reliable means of arresting hemorrhage. Dr. Pirrié says: "I am perfectly convinced that accupressure accelerates the healing of wounds, and that under its use, aided by metallic sutures, the avoidance of all dressings and perfect rest of the wounded part, in many instances the largest wounds, after major operation, will heal up without the formation of a single drop of pus." Add to these recommendations that accupressure is the easiest of performance, and the quickest of all the methods of arresting hemorrhage, and that the risk from pyæmia is diminished very greatly (no case having yet occurred), and impartial men will allow that the use of the ligature should be superseded almost entirely by that of the needle.

Mr. Bryant remarked at a meeting of the Royal Medical and Chirurgical Society in 1881, "That accupressure has been almost abandoned, because in the case of several arteries it was frequently followed by secondary hemorrhage, the vessel not being occluded long enough to allow of permanent clotting. The International Cyclopædia of Surgery, in the article on Injuries of Blood-vessels, says: 'Professor Esmarch makes no mention whatever of accupressure in his Surgeons' Hand-Book,' and I think he is quite right, because, though historically of importance, it is not of much practical value as a hæmostatic measure."

Certainly, except as a temporary expedient, or in circumstances where a ligature was not at hand, few surgeons now resort to it. The employment of torsion for the arrest of hemorrhage from large blood-vessels was suggested to Amussat by the recognized

fact that torn wounds do not bleed ; although at once adopted by Boyer, Dupuytren, Majendie and others, it was little noticed by the surgeons of other countries until the introduction of chloroform removed any object in hurrying over an operation. Revived by Mr. Bryant in 1868, it was soon applied by some surgeons to the exclusion of all other methods for the arrest of hemorrhage.

In an article on the Safety of Torsion in Amputation, by Thos. Bryant, Esq., Surgeon to Guy's Hospital, in *The Lancet*, of March 21, 1874, he says : " On March 6 I was called upon to remove a mutilated forearm from a man aged twenty. I amputated below the elbow joint, and arrested bleeding by twisting all the arteries, with the exception of the inter-osseous, to which I applied a ligature of carbolized catgut. I could not twist this artery on account of its immediate connection with the inter-osseous membrane ; at the end of six days hemorrhage took place from the stump, which was stopped by raising the limb ; but as it recurred toward night, the stump was opened. It was then made out that the bleeding had taken place from the inter-osseous artery. The vessel was again tied by my dresser, and the man has gone on well since. This is the only case of secondary hemorrhage from a stump that has occurred to me since I began the practice of torsion of arteries in January, 1868, and it is interesting to know that in it the bleeding came from an artery that had been ligatured, and that the ligature was of carbolized catgut. We have now had at Guy's Hospital upwards of two hundred cases of amputations of the thigh, leg, arm, and forearm, in which all the arteries have been twisted (one hundred and ten of these having been of the femoral artery), and no case of secondary hemorrhage." And yet torsion has almost been abandoned. Few surgeons to-day would trust to it except

in very small vessels, and in cases of operation in which from any cause it is necessary to save all the time possible.

The pneumatic aspirator was presented to the profession in 1869 by Dr. Dieulafoy, of Paris. In his own words : " On November 2, 1869, Professor Gubler presented in my name to the Academy of Medicine an apparatus which I had named an aspirator, and a paper giving a general view of a method called aspiration. In this paper I showed how aspiration constitutes a method of diagnosis and treatment, by means of which we can proceed with certainty, and without danger, in our searching for pathological fluids, whatever may be their seat or their nature. Exploratory punctures, less sure, and sometimes dangerous, will henceforth give place to aspiratory punctures, always harmless. The most delicate organs of the economy will be traversed without any bad results, and collections of fluid hidden in the depths of the tissues will not escape our means of investigation in the future. I said in this paper that urine could be aspirated in cases of retention, and that strangulated hernia could be reduced after the aspiration of the gas and fluids which distend the intestine. I pointed out that the same process was applicable to hydrarthrosis—pericarditis, acute and chronic pleurisy, to various kinds of cysts—in one word, to effusions of every description, serous, hæmatic, or purulent, which can be searched for, found and exhausted. The truly important point, which I made prominent in my communication to the Academy of Medicine, was the principle on which this method, which includes the treatment of all pathological fluids, is based ; and this principle is inseparable from two conditions, namely :

" 1. The use of extremely fine hollow needles.

" 2. The creation of a previous vacuum."

Listerism has now supplanted the treatment of collections of pus by means of the aspirator. Few surgeons to-day would be satisfied to use it in cases of strangulated hernia, unless they were seen very early indeed. But for purposes of diagnosis, for the relief of the over-distended bladder, in cases where it is impossible to pass a catheter, it remains to-day, as it was when invented, an exceedingly valuable and useful instrument, and one which should be in the hands of every surgeon.

Prof. Dittel, of Vienna, accidentally discovered that the slightest yet continuous pressure of a simple elastic thread causes absorption of the parts pressed upon, so that the thread eats its way into the structures, and this without pain. A girl died with severe brain symptoms, and it was found that the India rubber band of her hair net, which she had worn night and day, had ulcerated through the whole thickness of the calvarium, and set up meningitis. Prof. Dittel has now performed a large number of operations by means of the elastic thread or band, including five amputations of limbs. The time required for the separation of a ligatured part varies with the amount and density of the tissues which have to be divided. For example, for the separation of the mamma, from eight to twelve days are required. The above is taken from an article by Sir Henry Thompson in the *British Medical Journal*. To-day about the only use to which the elastic ligature is put is in cases of fistula in ano too deep for the safe use of the knife, and for the removal of soft growths in which the patient will not consent to the use of the knife.

Osteotomy, says MacEwen, in its broadest sense may be defined as a section of bone. It has, however, been regarded in a much more restricted sense, the term being applied to such divisions of bone as

have been proposed and undertaken for the relief of deformity, for the rectification of badly-united fractures, and for the straightening of limbs affected with osseous ankylosis which are fixed in a bad position (Osteotomy, page 33). All sections of bone for the relief of deformity, prior to 1852, were performed through open wounds. In that year Langenbeck made a division of the femur for ankylosis of the hip joint, by perforating the bone with a drill through a small wound in the soft parts, and then, introducing a narrow saw, divided the bone. He gave to this operation the name of subcutaneous osteotomy. In 1868, L. Stromeyer Little made use of a carpenter's chisel to divide the bone in a case of osseous ankylosis of the knee joint, working through a small wound half an inch in length. In the following year Mr. William Adams performed the operation of subcutaneous section of the neck of the thigh bone, known as Adam's operation. Previous to this only two surgeons (both American) had attempted the relief of ankylosis of the hip joint by division of the femur. By both, the thigh bone was divided just below the trochanter major, between it and the trochanter minor, with the object of getting the false joint in the axis of the limb. Neither surgeon operated subcutaneously. Ogston, May 17, 1876, divided the internal condyle of the femur with a saw, in a case of genu valgum, and Reeves, March 17, 1878, made a section of the internal condyle, in Ogston's line, with an osteotome, and on February 22, 1878, MacEwen first performed the operation above the condyle. Of six hundred and twenty-two cases of MacEwen's operation (section above the condyle) as far as can be ascertained there have been but three fatal-cases reported that could in any way be attributed to the operation. Out of one hundred and ten cases of Ogston's operation only two are reported to

have died, one from septic pneumonia and one from uræmia, six weeks after the section. The latter can not be attributed to the operation (Osteotomy, and Osteoclasia, by Charles T. Poore, 1884).

Esmarch's India rubber bandage and tourniquet, for the purpose of making operations bloodless, was first described by Prof. Esmarch at the Second Surgical Congress in Berlin. It was first used in England by Mr. Wm. MacCormac, in St. Thomas' Hospital, August 16, 1873. It has to-day practically superseded the use of other tourniquets, except for special cases to which it cannot be applied. The introduction of hæmostatic forceps for the suppression of hemorrhage during operations also marked a new era in surgery. Condurango, an alleged remedy for cancer, had a short lived newspaper notoriety, but it never was endorsed by the profession, although experiments were made with it, which only proved it to be utterly worthless.

The thermo-cautery of Paquelin was a distinct improvement over anything in the shape of a general cautery which had previously been devised. To Dr. Fessenden N. Otis, of New York, is undoubtedly due the credit of first demonstrating to the profession the real calibre of the male urethra. The old-fashioned idea, that where a No. 12 English bougie could be passed easily through the urethra no stricture existed, was completely exploded by his investigations, with a consequent increase in the sizes of bougies of from twenty-four to forty of the French scale, and the detection of hitherto unsuspected strictures of large calibre by means of enlarged bulbous bougies and the instruments of precision which he invented, together with a recognition of the causes of many obscure reflex nervous symptoms not previously referred to their proper cause, stricture of the urethra, often of large calibre. Since his demonstrations we can now

at last hopefully expect the radical cure of stricture, certainly in a large majority of cases; not necessarily by the operation which he has devised, but because under any plan of treatment which may be adopted the surgeon is no longer satisfied until he has restored the urethra to its normal calibre.

The revival of supra pubic lithotomy and the introduction of Dr. Bigelow's operation of rapid lithotrity or the removal of the crushed stone at one sitting under an anæsthetic have revolutionized the treatment of stone in the urinary bladder. Certainly for the removal of morbid growths in the bladder and for purposes of exploration the supra pubic route is the one now chosen by the majority of surgeons. Prof. Bigelow's first paper on rapid lithotrity appeared in the *American Journal of the Medical Sciences* for January, 1878. In March, 1878, three months after the appearance of Bigelow's paper in America, in a discussion following a paper by Sir Henry Thompson read before the Royal Medico-Chirurgical Society in London, the general conclusion of some of the best surgeons of England seemed to be that nothing more need be expected from lithotrity, that perhaps even it had been pushed too far, and that in future probably it would be better to crush less and cut more. Prof. Keyes, of New York, says of it in his article on Urinary Calculus in the "International Cyclopædia of Surgery," "This operation is to-day accepted by Thompson, and is described in the last edition of his lectures, to the exclusion of old-fashioned lithotrity, which he apparently no longer performs. Indeed, the new operation promises in a few years to displace the old one entirely, and for the most part to do away also with lithotomy for males who have passed the age of puberty."

Dr. Sayre first used his plaster jacket for the treatment of Pott's disease in 1875. Extension being

made by holding the child up by the arms—the weight of the body acting as an extending force—the cast was cut down as soon as it had hardened, and was fastened by a firm bandage above the hips and by an elastic one over the thorax, to prevent interference with respiration. By January 1, 1876, the jacket had been applied in more than sixty cases with the happiest results. The application was soon modified by using the suspension apparatus and the insertion of a dinner pad.

The treatment of hemorrhoids by the injection of carbolic acid was and is extensively practised, in the first place by pile doctors and subsequently by members of the medical profession. Dr. C. B. Kelsey, of New York, contributed a paper on this subject to the *American Journal of the Medical Sciences* for July, 1885, which he says is written in response to many inquiries whether he is still in favor of the method of treatment by injection of carbolic acid which he advocated in his book published in 1884. "In a period of a little over two years Dr. Kelsey has been called upon to treat no less than 200 cases of hemorrhoids, and in only two of these cases has he found himself compelled to resort to any other proceeding than injection. Dr. Kelsey uses carbolic acid solutions of 15, 33 and 50 per cent., and in some cases the pure acid, according to the severity of the disease, in the severer cases using the stronger and in the milder the weaker solutions. The injection is performed upon different tumors at varying intervals, in one case recorded fourteen injections were performed in three days. The maximum period occupied in the cure of a bad case is from ten to fourteen weeks. The injection often caused sloughing, but the amount of sloughing was always directly proportionate to the amount and strength of the injection. Patients operated on say that the pain of the procedure, as a rule,

is not greater than that caused by the ordinary hypodermic puncture. For a couple of minutes there was a smarting, tense feeling, and after that no sensation whatever. This had been repeated six or eight times till the patient was cured, and the intervals between each injection were passed in absolute comfort. One patient fainted on the table from the first injection. In no case have I had an accident of a serious nature. Never any signs of embolus, never any serious sloughing or inflammation, no trace of pyæmia or hemorrhage. The 200 cases on which the paper is based are all spoken of as cured. Since this paper was published Dr. Kelsey has, we believe, practically abandoned the operation.

The discovery of the local anæsthetic effect of hydrochlorate of cocaine has made a distinct impress on the progress of modern surgery. Quite extensive operations have been performed on areas of tissue made insensible by its local distillation or hypodermic injection. That it is a method of value there can be no doubt, but that it is not free from danger has also been abundantly proven. Its precise value can probably hardly yet be estimated.

Intubation of the larynx as a substitute for tracheotomy, as suggested by Dr. Joseph O'Dwyer, has been extensively practised. It is too soon yet to prophesy what its ultimate position will be as a surgical procedure.

Among the minor surgical inventions, Morton's pure rubber bandage should not be forgotten.

Nephrotomy, an incision into the kidney for purposes other than the extraction of a calculus, is now performed for hydro-nephrosis, when the cyst refills rapidly after having been punctured for hydatid cysts under similar circumstances, or when from the number and size of the daughter cysts the contents cannot be evacuated through a small tube; for pyone-

phrosis, and for any case in which the kidney has been converted into an abscess, whether from the presence of calculus or tubercle. There is no doubt that surgery is indebted to Mr. Henry Morris, of the Middlesex Hospital, for the invention of the modern operation of nephro-lithotomy. He performed his first operation in 1880. Some hundreds of operations have been performed since then; but the operation of to-day practically continues as Mr. Morris left it (Greig Smith). The late Professor S. W. Gross, in a paper published in 1887, states that of sixty-three examples of attempted or accomplished nephro-lithotomy only 3, or 4.76 per cent. perished, a measure of success which is seldom attained in any other capital operation. *Nephrectomy*, or the removal of the kidney from the living body was first performed as a planned operation in the human subject by Gustav Simon, of Heidelberg, in April, 1869. Three different surgeons had preceded Simon in excising the human kidney, but without knowing the nature of the tumors they were removing until the operation had been completed. The first of these operations had been performed in 1861; the others in 1867 and 1868. The ventral method was employed in each, and all the patients died. Simon's case was the fourth in which nephrectomy was performed, and the first in which the lumbar method was adopted. The patient fortunately recovered, and from that time the operation has been recognized as a legitimate one.

Nephrorraphy, the operation of fixing by operation the wandering kidney in the loin was first performed by Dr. E. Hahn, of Berlin, in 1881. Professor Keen (Transactions of the American Surgical Association, Vol. VIII), gives a table of one hundred and thirty-four operations with four deaths, a mortality of about 3 per cent. Of one hundred and twenty-one cases fully

recorded there were, after three months ; cured, 63 ; improved, 21 ; failed, 19.

Splenotomy and *splenectomy*, Dr. McCann, of Pittsburgh (Transactions of the American Surgical Association, Vol. V, 1887), gives a table of all the cases operated on from 1881 to 1886, inclusive, of nineteen cases in all, with thirteen recoveries. Ashhurst has collected forty-three splenectomies for disease, with thirty-one deaths, and twenty-one operations for injury or prolapse, all successful (Greig Smith).

Cholecystotomy and *cholecystectomy*, June 15, 1867, Dr. Bobbs, of Indianapolis, in an obscure case of abdominal tumor opened the abdomen, and then the tumor, which proved to be the gall bladder, and removed a number of calculi, while not knowingly intending to do cholecystotomy (he calls it lithotomy of the gall bladder), yet such it actually was. In April, 1878, Dr. Marion Sims deliberately planned and performed the operation in a case of dropsy of the gall bladder and removed about sixty stones, as well as the fluid contents, the patient died eight days after the operation, and at the post-mortem examination there were found sixteen other stones in the gall bladder. At the present time, as regards technique and results, Tait holds the leading place with a series of some twenty published cases, all successful.

Langenbuch, 1882, first successfully removed the gall bladder. The gall bladder was hypertrophied and adherent to the neighboring tissues, and contained a large number of stones, some of them adherent to the walls and threatening perforation. In twenty-two cases collected by Depaye there were only two deaths as a direct results of the operation. Thus far the mortality of cholecystectomy (under 10 per cent.) is more favorable than that of cholecystotomy (over 15 per cent.)

Hepatotomy, the name usually given to direct incision through the liver tissue after abdominal section, is the operation which most commends itself for hepatic abscess; with laparotomy the risks of wounding omentum or bowel are done away with. We see and can control the bleeding from the liver. The danger of escape of the abscess contents into the peritoneum can be met and overcome, and if they do so escape they can be mopped up, while lastly, and not least important, a second abscess can be seen and opened, as has already been done in at least one case (Thorn-ton.) To Tait, of Birmingham, belongs the chief merit of introducing and establishing the operation with laparotomy. He had done the operation ten times when his work was published; nine times for hydatids, and once for abscess; all were successful. The advantages of this method over aspiration; puncture by trocar, leaving the canula in situ, opening by caustic or by thermo-cautery. Incision *à deux temps*, after the artificial formation of adhesions between the liver and abdominal wall are too evident for discussion.

Gastrotomy, for the removal of foreign bodies from the stomach, and gastrostomy for the formation of a gastric fistula by operation, were both performed more than twenty-five years ago.

Digital dilatation of the pylorus was first performed by Professor Loreta, of Bologna, on September 14, 1882. Dr. J. M. Barton has tabulated twenty-five operations by different operators on twenty-four patients; one patient having been operated on twice successfully by Professor Loreta. From the twenty-five operations there were fifteen recoveries and ten deaths, making a mortality rate of 40 per cent. Professor Loreta has since performed dilatation of the cardiac orifice of the stomach with success.

GUNSHOT WOUNDS OF THE ABDOMEN.

The treatment of gunshot wounds of the abdomen by laparotomy is one of the latest development of modern surgery. Up to 1885, according to Parkes, only six operations for this class of operation were recorded. Dr. Kinloch, of South Carolina, operated in 1863. Coley tells us that the first laparotomy for gunshot wound of the abdomen was by Baudens in 1836. He resected eight inches of the small bowel and united the ends by Lembert's suture. After the death of the patient, three days later, an undiscovered wound of the cæcum was found. Baudens operated a second time for wound of the transverse colon. In this case simple closure of the wound was followed by recovery. Kocher, of Berne, had a success in 1883. Among the most remarkable of laparotomies for gunshot wound was one by W. T. Bull, of New York, preformed in 1885, in which no fewer than seven intestinal perforations were discovered and closed. The patient made a complete recovery. To this, in the following year, he added another success quite as remarkable. In Kocher's case, operated on three hours after the receipt of the injury, the stomach was perforated.

The statistics of abdominal section for traumatism presented at the Newport meeting of the American Medical Association by Morton, in 1889, given one hundred and ten cases of section for perforating gunshot wounds with thirty-six recoveries, a mortality of 62 per cent. Of all penetrating gunshot wounds of the abdomen nearly 88 per cent. are fatal, therefore the total mortality, considering the nature of the injuries, the usual condition of the patient when placed on the operating table, and the necessarily tentative nature of the earlier operations, cannot be

regarded as other than exceedingly satisfactory (Greig Smith).

LAPAROTOMY FOR STAB WOUNDS OF THE ABDOMEN.

Morton's statistics, 1889, given seventy-nine cases, with forty-eight recoveries, a mortality of 39.24 per cent. This must be regarded as a very satisfactory mortality, considering the nature of the injuries (Greig Smith).

The wonderful development of cerebral surgery in the last few years, in which some of our Fellows have been largely instrumental, has been one of the most gratifying and successful evidences of the progress of modern surgery. The successful removal of intra-cranial tumors, the location of cerebral lesions and their removal by the trephine and knife, are becoming matters of daily occurrence. In the language of Prof. Charles K. Mills, "more and more has that region been narrowed which cannot be reached by the venturesome surgical explorer." The lateral aspect of the pre-frontal lobe, the entire motor area, the superior and inferior parietal lobules and the upper temporal region can, of course, be attacked with the greatest facility. In the regions difficult, yet possible, of access, lesions of large size and of displacing character will be more readily reached. The orbital surfaces of the pre-frontal lobe can be reached and large displacing lesions removed by trephining low down in the frontal bone. In Durante's case the tumor removed occupied the left anterior fossa of the cranium. Almost the entire temporal lobe, with the exception of the parts bordering on the mid-brain, is accessible. The occipital lobes have been operated on successfully. With care the great median fissure may be entered for lesions of the marginal convolutions and limbic lobe. The longitudinal sinus has been successfully plugged and ligated. The

outskirts of the ganglia have been approached, and the ventricles have been pierced. Even a tumor situated on the intra-cranial portion of the auditory and facial nerves can probably be reached and removed. Suckling and Jordan, Bennett May, Horsley and Weir have looked, during operation, with the eyes of the flesh on the foramen magnum itself. Absolutely invisible then are only the middle region of the base and its bordering convolutions, the corpora quadrigemina and pons oblongata.

The modern treatment of hydrophobia by the method of Pasteur, and the still more modern treatment of tuberculosis, surgical as well as medical, by the method of Koch, have aroused more interest, popular as well as professional, than anything that has occurred in the broad realms of medicine since the discovery of vaccination. I quote the following from an editorial article in a leading Philadelphia newspaper of last week :

IMPORTANT MEDICAL ANNOUNCEMENT.

Prof. Lister, perhaps the most distinguished pathologist living in England, delivered a lecture at King's College Hospital, on his return from a visit to Berlin, where he had exceptional opportunities for seeing Prof. Koch's work, not only with regard to tuberculosis, but also in general bacteriology. What he says of the first subject presents little that is new to the public, except, perhaps, that he emphasizes the points that have already been presented by other medical men. He professes absolute belief in the value of Dr. Koch's lymph as a *diagnostic* agent and as a cure in some cases of tubercular trouble, and suggests more hope of its being a cure for consumption than most of his conferees.

To the general public, however, the conclusion of his address is more interesting. He told his auditors of the promising results obtained by Koch concerning two of the most dreadful diseases that afflict mankind: diphtheria and lock-jaw. He saw animals suffering from these diseases apparently cured by injections of certain unnamed substances. Further, he saw animals that had been treated with these substances

who were proof against contagion or inoculation by the same diseases, though applied in a concentrated form. But to the medical mind the statement that this newly-discovered curative was "an inorganic chemical substance as easily obtained as any article in the *Materia Medica*" is the most surprising. Some physicians have long suspected that both the destructive diseases named are produced by living organisms, and probably by vegetal organisms. That any substance, especially an inorganic one, should cause the death of these organisms in the tissues of the body without causing injury to the much more delicate and higher organized animal on which they feed, is a theory which medical men will, very probably, be slow to accept. Yet Prof. Lister not only states that he has seen these results, but offers the hope that a similar substance may be obtained for the cure of tuberculosis.

In the same number of the *British Medical Journal* in which this address is printed is an article by another prominent pathologist, Dr. Russell, of Edinburgh, in which—but with proper caution—he charges the existence of cancer to the presence in the tissues of another organism, a fungus allied to the yeast-plant. If the next few years shall develop cures for four of the most dreadful diseases with which the human race is afflicted—consumption, cancer, diphtheria and lockjaw—the marvelous advance of antiseptic surgery, to which Prof. Lister himself has contributed so much, will be rivaled by these later marvels.

Time fails me to even allude to many of the suggestions of modern surgery, or of brilliant operations which have been performed, but whose value have not been established, and I have purposely refrained from entering the domain of the gynæcologists, with whose wonderful performances and brilliant successes we are all familiar.

When we consider the improved mortality after all operations, the result of Listerism, the gospel of cleanliness, and an improved technique, the hitherto hopeless cases which are now daily relieved from suffering and restored to health and usefulness, by the performance of operations that twenty five years ago were either absolutely condemned, obscurely hinted

at, or not even conceived, we must acknowledge that surgery has progressed, that human suffering has been relieved and human life has been prolonged, to an extent never before dreamed of in such a space of time, and yet we seem to be only on the threshold of new discoveries and of new methods.



